ITEMS OF INTEREST.

VOL. VI. PHILADELPHIA, FFBRUARY, 1884. No. 2.

Thots from the Profession.

THOROUGHNESS IN DENTAL OPERATIONS.

BY W. S. ELLIOTT, M.D., D.D.S., GOSHEN, N. Y.

The rapid advancement in dental science is made evident to the observer by the differences between the standards of excellence on the part of one and another of those operators who pronounce each and every effort good. One may perform an operation which he himself may deem *only* good, and which another would pronounce excellent, yet the superlative praise bestowed would not enhance the quality of the performance, but would rather mark the standard set up for all cases which, though pronounced excellent, would only reach mediocrity; whereas the consciousness that each operation is *only* good, tends to that increased energy which at last ends in the accomplishment of really excellent results. The disparity is made more evident as the test of time is applied, for the one who satisfies himself in pronouncing his performances good, may, sooner or later, be called upon to rectify that which was evidently a shortcoming, either through ignorance or want of skill; and on the other hand, the *only* good is followed by that which is truly most excellent. The motive in the one case as in the other is doubtless an honest one—to do all that would seem to be required for the good of the patient; yet it is not always satisfactory to those who repose confidence in that professed skill which so often controverts the results.

The young student inserts a filling which his preceptor may pronounce excellent; and such it may be under the circumstance of his limited knowledge and experience. The measure of praise is not unduly extended, for comparison is made to a standard temporarily set which to the beginner will be at least appreciable. As knowledge is acquired and experience gained the standard is raised, and that effort

which was looked upon as especially meritorious is now regarded as perhaps quite defective in many essential particulars. Where the motive then is known to be unquestioned, the want of complete success is referable only to the want of knowledge of what is required in any given case; and he who assumes the practice of dentistry without that tuition which is capable of working up to the highest standard of excellence, will fall far short of what is required of him, and at the same time necessarily to the disparagement of his own interests.

How then shall the desired end be gained? The facilities for professional education in this country are so ample, that excuses for foregoing the advantages presented are utterly invalid, and the student who has served his term of private study need not be thwarted in his purpose of honorably practicing his chosen and most worthy calling.

Empiricism and mountebankery rear their hideous forms from the undergrowth of ignorance all over this wide land, and would seem to prosper—to those who are struggling from day to day, honestly, earnestly, and intelligently to obtain a livelihood and achieve a worthy reputation. But the mountebank show is false, it is glossed over with the gold from the pockets of many a worthy and confiding patient, who will, most assuredly, pronounce the dictum upon that avariciousness and dishonesty which clutches at their hard-earned gains with pretentious assumptions. Then, to those who would eschew this class of operators and would rise above the level of mediocrity, I would say, read, study, write; and when opportunity presents, fall into the line of noble pioneers who are working, laboring, striving for your good.

The basal knowledge as offered by our collegiate institutions being attained, then work—work with a will to gain that goal planted by your Alma Mater. Be honest, be true.

But it was not my design to offer a dissertation upon the moral obligations of the dental practitioner, but to make reference to a few of the causes of failure which are daily brought to my observation.

The operation of filling a cavity, I deem, is not necessarily complete, until the visual causes which would promote further decay are removed; for instance, a spongy or fungus gum approximates a cavity of decay to that extent that it is necessary to wedge it back in order to gain access, and, though the operation of filling is skilfully performed, a degree of failure may be anticipated by allowing the gum to return over a portion of the filling, thereby forming a receptacle for the retention of depraved mucus and other foreign matter. This is but little better than a porous or spongy filling. The proper treatment of the gums is necessary to complete success.

Again, in reference to the treatment and filling of pulp cavities which have remained open for an indefinite period. To fill such teeth upon first presentation is almost certain to excite the periosteum to a

degree of congestion or inflammation; and too great haste in the treatment thereof will tend to similar results. In most cases of failure it will be proven that either sufficient time or care was not taken in the preparation of the cavity; that the dentinal exudates were turned back too suddenly upon the investing membrane, thereby causing irritation. My usual plan is to thoroughly cleanse the cavity by excavating and syringing with hot water; then apply with cotton, wound upon a broach, a solution of permanganate of potash,—5 grs. to the ounce of water—or the following:

℞

Alcohol,	℥i
Tr. Opium,	ʒii
Chloroform,	ʒv
Sulphuric Ether,	ʒvi
Gum Camphor,	℥ss
Oil Cloves,	ʒi
Oil Lavender,	ʒi

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After saturating the cotton, probe with the above; take upon it a few crystals of salicilic acid, and with this compound give the canal a good thorough cleaning, leaving a pledget of cotton very loosely packed in the tooth. Repeat the process daily until all fetor shall have passed away; then fill with phosphate of zinc.

In one week, if all has gone right, a permanent crown filling may be inserted over the zinc. This plan, in my own practice, is generally attended with success.

Another common cause of failure, in the filling of approximal cavities, is a want of thoroughness in excavating that portion of the dentine nearest the neck of the tooth. This is particularly so when there is a spongy condition of the gums, which, as before observed, should be first restored to perfect health.

Many fillings too are failures from the imperfect condensation of the first portions of gold introduced. After anchoring the initial pellet, the utmost care should be taken that it does not become moved from its position; to prevent which, it is desirable to have an assistant who will press this portion of the gold to its place, while the operator proceeds to weld to the piece thus secured.

Finally, let each successive step in the operation be thorough, and you will have the satisfaction of knowing that the result is really excellent.

The ITEMS is so full of thoughts for the laity that many dentists leave it on their center table for the perusal of their patients and those who accompany them. Try it.

THE REFLEX ACTION OF THE NERVES.

In the discussions of the American Convention, Dr. Lovejoy says: I would like to relate a case in point. I was doing a piece of work for a young lady, and her sister occupied a seat some distance removed, and while I was filling the tooth she seemed troubled with her toe. My patient turned around and said: "Is that toe still troubling you?" "Yes, and I want it cut off." While filling the tooth I questioned, and, by inquiry, found that the pain was first in the arm and then in the shoulder. As soon as I had concluded, I requested her to take a seat in the chair. She said she had never had anything done. "I never had toothache. I have about as good teeth as the average, and as ever I want." Her sister finally joining me she seated herself. I rarely ever saw a finer set of teeth. I could not find a speck of decay. The teeth were regular, and I was about giving up when I noticed that one of the wisdom teeth was missing—she was 25 or 26 years old. I asked her if she had one extracted; she said no, and I said to her: you have still one to get. I noted a speck in the gum and cut in with the probes, and I never before saw such an effect produced; the wisdom tooth had impacted against the other molar. I heard nothing more of the case for about a week, when her doctor called and questioned me about the case. She had been under treatment for six months for neuralgic and other troubles. Two weeks after, the sister called on me and told me she had no further pain in her toe. I do not think I have seen any other case where the pain was so far away from the cause of the pain.

Dr. Read has met with deafness caused by the wisdom teeth crowding that way, and producing a continual ringing in the ears for years from exostosis. I had a case which was relieved entirely by drawing the wisdom teeth.

Dr. John Allen—has had a case where the eye was considerably affected by it.

Dr. White says: "I remember a very interesting case bearing on the subject. The patient is now dead, but was very well known. He was an old gentleman, and was suffering very much with his left eye. He was under treatment for a long time, and every remedy seemed to fail. The old gentleman got to be worse and worse; seemed to be failing generally. He was under the treatment of one of the most eminent physicians. The doctor sent him to Saratoga. The old gentleman spent a couple of months here without benefit. He was returning to Savannah, but died on the passage. That was at least reported, but it proved incorrect. He came into my office and was wearing a bandage over the eye with the prospect of losing the sight. He was suffering with necrosis of the lower jaw. I advised the removal of the teeth; they were very loose, and there was a great deal of inflammation

around the soft tissue. I thought that had some relation with the disorder in the eye. I removed them. There was excessive pain with the removal of each; they were very sore to the touch. In probably five or six minutes after the teeth were removed, he said his eye felt better. He remained in my office one half hour, and insisted that his eye was better. He called the next day to thank me for removing the teeth, and two weeks after that he could use one eye as well as the other.

DIAGNOSIS.

BY DR. L. C. INGERSOLL, KEOKUK, IOWA.

[Read before the Iowa State Dental Society.]

Diagnosis is the art of detecting disease through the interpretation of symptoms. Anything is a symptom that foreshadows, is the result of or in any way is a manifestation, expression or sign of disease.

Diagnosis is the most comprehensive science relating to the practice of dentistry. it includes pathology, because it is a careful application of the principles of pathology to specific cases. It includes anatomy, because disease is localized in organs, structures and tissues of the body—affects contiguous parts and traverses to remote parts over nerve and vascular connections, which must be understood in detecting disease. It includes physiology, for no one can detect deviations from normal conditions and function unless he knows what normal performance of functions are and knows well the economy of life and health. It includes all except therapeutics, which is the next step beyond, and is one of the dependencies of diagnosis. There can be no rational treatment or cure of disease without a correct diagnosis.

The word diagnosis is derived from two Greek words—*dia*, through, and *ginosko*, to know—to know through. It implies a knowledge that penetrates—a perception of the inside as well as the outside of things. Practically considered, the term means, *know your case—know it thoroughly—know it through and through* before you attempt to treat it. No word could have been chosen to denominate this branch of science which could be more clear, pointed and technical, or have a more imperative force than *diagnosis*.

To gain a clear and comprehensive meaning of the word is to gain a high conception of the importance of the science, and a prompt suggestion of the method of far too many failures.

The most common and plainly discernible symptom of disease is pain. Yet the cases are numerous of disease not attended with pain. I might employ a tautological expression and say that dis-ease—using the word disease in its two senses, its technical and its elementary sense. The technical word disease is the compound of two words—

dis, and *ease*, which mean want of ease, or discomfort. To say, therefore, that dis-ease or discomfort is the most common expression of disease, would be both true and forcible. Want of ease or discomfort is the negative expression of pain. Increase the discomfort, and pain in a positive form is sensibly manifest.

Pain is so common an attendant of disease, that, in its absence, other manifestations are quite often overlooked, and its presence is often misinterpreted.

This leads me to suggest a caution, not to trust sensation too implicitly as a guide to diagnosis. Take a simple case of dentalgia. A patient comes in complaining of toothache in one of the inferior bicuspids. He is certain concerning the location of the pain. On examination you find the tooth but slightly decayed and question the possibility of pain arising from it. But should you trust to the sensation experienced, and without further examination dismiss your patient as having only a case needing the operation of filling, you might, in so doing, make a serious mistake. Had you made further examination you probably would have discovered exposure of the pulp of the second or third molar as the source of the pain, and find an explanation of the pain in connection with the bicuspid, in the fact that the dental nerve supplying the molars sends a branch through the mental foramen located just below the root of the second bicuspid, and is distributed outwardly to the lower lip. By inflammatory action in the mental artery the nerve has become constricted at the point where it passes through the outer plate of the maxillary bone and causes this bicuspid pain.

Again, take a case of determining the vitality of the pulp by refrigerants—a drop of water or a piece of ice is placed upon a tooth. The excitement of pain by such a test is not alone sufficient evidence of vitality in the pulp. Should your patient be of decided neuralgic diathesis, cold water could scarcely be tolerated on any of the teeth; even pulpless teeth are sometimes so susceptible to its influence as to deceive both the patient and the operator concerning the character of the sensation experienced.

Again, nervous fear deceives with the apprehension of pain and is attended by all the outward signs and demonstrations of pain, when no physical pain is actually experienced.

Suppose you attempt the test of vitality by drilling into the dentine. In many cases the trembling fear that the instrument *may* suddenly plunge into the pulp chamber produces in the mind of the patient an impression akin to that of actual pain, and pain is reported though it may afterwards be found to have been but the exhibition of fear.

Drilling to test the vitality of a tooth may deceive also in another way—by the manifestation of the pain, even though the pulp be entirely wasted.

I know, we are in the habit of attributing all sensation in the teeth to the presence of the pulp. But histology reveals other vital connections with the hard tissue so intimate in their relations to the pulp that the *dead line* of pulp extinction is scarcely to be traced in the dentine.

It is not uncommon to find the dentine tubuli opening into the canaliculi and lacunæ of the cementum; thus forming a vital connection between the cementum and the nerve plexus that is spread like network over the periphera of the dentine. If then the pulp has been devitalized without exciting any serious peridental disturbance, vitality may yet remain in the uncalcified portion of the nerve plexus that underlies the enamel, after the pulp chamber and root canals have been entirely vacated.

Sensation on the entrance of the drill is not, therefore, certain evidence of the presence of a living pulp.

This vital connection of the dentine with the cementum, is an important fact to be remembered in estimating the vital support and longevity of a tooth after its pulp has become extinct.

I desire to call attention to the very critical judgment required in cases like the following: A cavity is prepared in the anterior portion of the mouth, and no suspicion has been aroused of approach to the pulp. The rubber dam has been adjusted and a thorough cleansing of the cavity accomplished, the foil is prepared, and as your patient sees the gold about to enter the tooth he enters his mild protest by the remark: "Doctor, it aches."

For a moment the gold cleaves to your tweezers while you muster your etiology for all possible causes of dentalgia, and one by one they are applied to explain the manifestation of pain. Should you conclude that, although you had not before discovered it, the pulp must be nearly or quite exposed and need capping, your operation might be entirely successful while your diagnosis is entirely wrong. And as for the operation of capping, it would receive unwarrantable credit.

Should you conclude it to be the wisest to delay the operation a few days for topical treatment, and apply anodynes, escharotics, astringents, etc., the pulp might survive it, and the after operation of filling be painless and every way successful, yet your diagnosis be very wrong.

Should you conclude that to make the operation safe the pulp must be extirpated before filling, your whole operation might be successful as a dernier resort for the preservation of the tooth, and still your diagnosis be wholly wrong by mistaking the cause of the sensation of pain.

To arrive at a correct diagnosis of the case, consider the changed relations to its normal surroundings. The natural protection of the lips has been removed. The warm influence of the saliva has been excluded by the rubber dam. That protection afforded by the dentine

has been removed by the work of excavation, and nothing prevents the air of the room—possibly the air from an open window—from direct contact with the floor of the cavity. Under these abnormal conditions and by this means the temperature of the pulp is suddenly reduced several degrees below its normal temperature, and the sudden vascular contraction thus induced causes pain.

It is evident, therefore, that this sensation of pain is no evidence of disease in the pulp, and therefore needs no therapeutical treatment. And there being no exposure of the pulp and near approach to it, the case needs no capping. Much less are there any conditions present that indicate extirpation as a remedy. A rapid filling and restoration of the tooth to its normal environment, restores the normal temperature, relieves the pain, and all is well.

I have said that the diagnosis must precede all rational treatment. It must also accompany treatment to the end— until health and soundness are recovered. Under treatment there are a series of modifications of conditions indicated by changed symptoms. These modifications must be observed with the same critical care as were the first developments of the case. In this connection I desire to call attention to the deceptive influence of anodynes, narcotics and antiseptics.

To obtund nervous sensibility is an immediate relief of pain. So is also a removal of the exciting cause a temporary relief. But neither is certain evidence of remedial effect on the disease.

Many a man has taken copious draughts of whiskey to cure the toothache. They may feel the pain less, though the disease steadily goes on. With carbolic acid and creasote, one may continue to obtund the sensibility of a tooth till the pulp, being but half alive, will be obtunded to death. The treatment having the effect to cause a painless death to the pulp, may be interpreted to have restored the pulp to a condition of health—and therefore painless. Of course, to fill a tooth under this false diagnosis would be disastrous.

Suppose a patient comes into the office complaining of slight pain in a molar tooth. There is a small opening in the central depression of the crown, and spreading under the enamel, yet not involving any considerable portion of the tooth substance, has never ached till within a day or two, and at no time has the pain been severe, is worse after eating than at any other time, and after picking the food from the cavity the pain ceases.

You hastily remove the contents of the cavity—syringe with warm water; apply a pledget of cotton moistened with carbolic acid, and dismiss your patient to call again in one or two days. On his return he reports having experienced no pain since the former treatment. You consider the report favorable and continue the treatment. Sealing up the cavity you dismiss him for two or three days. After this,

the pain not having returned, you dismiss your patient for a longer period—not wishing to over medicate—but advise an immediate return to your office on a recurrence of the pain. There is no recurrence of the pain, and at the time appointed for the next visit you determine to fill permanently. You are delighted to find the bottom and the lateral walls of the cavity firm and hard, and free from painful sensations on touch of the instrument. There being no peridental inflammation, neither pressure or malleting causes any flinching. The operation is completed and the patient goes on his way—but to return again, complaining of pain worse than he has ever experienced before.

What is the matter? A false diagnosis from the beginning, and self-deception by the antiseptic influence of carbolic acid.

A true diagnosis of the case might be thus stated: The tubuli of the dentine intervening between the cavity of decay and the pulp cavity were vacant, by complete solution of the dental fibrils that have occupied them. The pulp itself was in a state of suppuration and slow decomposition. In the decomposition, gases were formed, filling the vacant portion of the chamber, and being emitted through the open tubuli. When these gases could pass out as rapidly as formed, no pain was felt. When the exit was impeded by foreign substances accumulated in the cavity of decay, the expansive force of the confined gas created pressure upon the vital portion of the pulp and caused pain. The more intense pain after eating was occasioned by the more complete stopping up of the cavity by compressed food. When the food was picked out, the confined gas by force of expansion passed slowly out through the open tubuli, and relieved the pain by relieving from pressure the living portion of the pulp.

When the therapeutical treatment was resorted to, the cleansing of the cavity gave free egress to confined gas, and whatever solid matter was put in solution by decomposition; and the antiseptic influence of the carbolic acid, arrested so completely the decomposition of the pulp, that whatever gas was formed readily made its escape without producing any reactionary force upon the pulp, and thus the pain was entirely arrested. Mark, I say the *pain*, not the disease, was arrested. The continued treatment simply retarded the disintegration of the pulp and rendered the process painless.

When the operation of permanently filling was performed, antiseptics could no longer be introduced, decomposition was renewed, and, there being no possible escape for the resulting fluids and gases, the pain necessarily became intense.

There are probably no greater failures in diagnosis than are made with regard to the pathological condition of the dental pulp. This delicate organ is so concealed from view and its manifestations of disease so peculiar and obscure, that a correct observation of symptoms

is extremely difficult, and great allowance must be made for errors of judgment concerning its pathological state. Experience is a large factor in correcting such errors.

When the pulp of a tooth has become exposed to external influences, a series of pathological conditions in more or less regular succession may be considered inevitable, unless the disease is arrested. Our knowledge of the pathology of the pulp must depend upon our knowledge of the anatomy of the organ and of general pathology in relation to similar structures. The function of the pulp is so limited and so unimportant relative to other vital organs that the functional disturbance under disease can seldom be made a matter of observation. While on the other hand, the limited vitality of the pulp, its slight tenacity of life, its tendency to obliteration, all point to structural change of the organ under disease; and this is no doubt the tendency in all cases of exposure.

THE TEETH IN SICKNESS.

EDITORIAL IN BRITISH JOURNAL OF DENTAL SURGERY.

Undoubtedly the teeth suffer more or less during prolonged sickness, partly from lack of nourishment at such a time, partly from medicines, but mostly from lack of cleanliness. Although at such times the physician is the one to whom the case is entrusted, we should do *our* share toward the patient, if in no other way, at least, by reminding them of the care the teeth need. In cases of serious moment, acute cases, or where the life is in danger, these smaller matters may be left at rest; but such dangerous periods are of short duration, as the main reason of the ruin of the teeth during and after sickness, is the lack of resistance on the part of the teeth, diseased fluids of the mouth, and in nearly all cases the neglect of cleanliness, permitting food and epithelial cells to decompose, and thus perform their pernicious work. To eliminate the first cause will fall within the province of the physician, by prescribing such diet as tends to strengthen the system and remedy the secretions, and counteract their destroying influence. At the same time cleanliness of the mouth will be necessary, in order to prevent the action of medicines while passing through the mouth. In cases of severe illness, the patient will be likely to be too weak to apply the brush and mechanical means of removing foreign matters, therefore it will be best to resort to mouth-washes, and the more simple the washes are the better. All perfumed or elaborately prepared washes should be discarded, as the sick always prefer the simplest of everything. The only one of our antiseptics which is disagreeable to patients, carbolic acid, can be supplemented by others more agreeable.

For a mouth-wash the permanganate of potash will be found service-

able (1 part permanganate of potash, 100 to 150 parts of water), to which can be added some camphor, as the metallic taste is disagreeable; a solution of boracic acid, one in 20 or 30; or the following: Tincture of benzoin, 10 parts; tannic acid, 20 parts; alcohol, 30 parts; oil of peppermint, a sufficiency. Put 10 to 20 drops in a glass of water. In order that some benefit be derived from these washes, they should be held in contact with the teeth at least for one minute. Medicines containing iron should be taken through a tube.

CIVILIZATION AND THE TEETH.

BY R. FINLEY HUNT, OF WASHINGTON, D. C.

The perfect development, co-adaptation and health of the teeth and their surrounding tissues are found to exist, with a few exceptions, to a far greater extent among the uncivilized than among the civilized peoples of the world—in fact, it is known, that as the onward progress or conquest of the civilized races breaks into and changes the habits of the uncivilized, the physical state and health of the latter are impaired. The crania in the Army Medical Museum at Washington exhibit a good state of development and health of the teeth of the Esquimaux, of immediately preceding generations of the northwestern American Indians and of the Sandwich Islanders before their intercourse with civilized nations.

So far as is known, the state of the teeth of the Esquimaux is unchanged, while those of the Indians are somewhat affected by disease, and those of the Sandwich Islanders still more so.

The testimony of Indians of various tribes visiting Washington, as given to the writer, is that their teeth were good before the white man came among them, but that they have since been getting bad.

It is a mere matter of form to state that among civilized peoples the state of the teeth is simply deplorable.

It can but be concluded that where the teeth have been perfect this perfection was due to a strict observance of hygienic laws, and that where they are imperfect these laws have been violated.

Now what are the circumstances and habits of living, or, in other words, the external and visible or tangible conditions precedent to health with the uncivilized? Abundant fresh air and light, ample physical exercise, simple, plain food of such character as to require thorough mastication, and water as a beverage, and these latter only used when hunger and thirst required them. What with the civilized? As a general rule, almost the reverse of all this.

In the former, the power of assimilation of food and distribution of tissue material is perfect; in the latter, impaired. Food containing tissue material will be introduced in vain into the stomach, even in

excess, if the functional power of assimilation and distribution is defective. The value and importance of this power is not sufficiently appreciated, where therapeutical treatment is used to supply deficiencies in tissue material.

The conclusion of the whole matter is that the true hygiene or system of rules for the promotion of health is, so to live as to have an abundance of light and fresh air, to take ample exercise in them, to eat plain and simple food, mostly solid, with thorough mastication, particularly if it is vegetable, and *that* only when hungry, to use water as a drink when thirsty, and to take a sufficient amount of sleep. Thus would we follow the course so plainly marked out by nature, and if we are guided by her teachings we will rarely if ever go wrong. But unfortunately there is no hope that health, though so precious a blessing, will be secured at such a price, unless in so few cases that they may be considered exceptional.

However, if the habits of living enjoined by these hygienic rules should be universally adopted in this country, it would require several generations of recuperation and heredity to bring our people to the state of health enjoyed by the Esquimaux, Indians and Sandwich Islanders in the days of their purely primitive habits of living.

REMARKS ON THE NATURE OF CHANGES WHICH OCCUR AFTER THE EXTRACTION OF THE NATURAL TEETH, AND THE PROPRIETY OF EARLY INTRODUCTION OF ARTIFICIAL SUBSTITUTES.

[A paper read before the Cincinnati Dental Association.]

BY PROF. J. RICHARDSON.

In a brief period after the extraction of the teeth, inflammation, of a higher or lower grade, is established, accompanied with some degree of tumefaction and tenderness in the parts implicated. If the inflammation is moderate in degree, and is permitted to run its usual course, it will be entirely consistent, in its ultimate consequences, with the requirements of the economy. If immoderate in degree and long continued, the natural processes or actions in the parts, determining the various changes which take place, will be more or less diverted or embarrassed.

The immediate issue or product of the inflammation which occurs is fibrinous exudation from the ruptured surfaces of the periosteum of the socket, which, in its incipient stage of organization, takes the form of granules. In from ten days to two weeks, the socket is partially or entirely occupied with the fleshy substance. During this period, the actions are directed almost wholly to *reparation.* Absorption does not, ordinarily, occur until the inflammation has, in a great measure, subsided, and hence, at first, there is enlargement or tumefaction of the

gums, rather than waste by absorption. As the inflammation subsides, however, these parts, which have no longer any special functions to perform, as the more protuberant portions of the alveoli and adherent gum, begin gradually to waste away under the action of the absorbents. Concurrently with this absorption there is deposition of osseous material within the socket through some agency of the granules filling it, so that, in course of time, the cavity is partially filled in with bone analogous in structure with the maxilla proper, of which it ultimately forms a part; while the more superficial portions of the granular formations are transformed into tissues identical with the soft structures immediately surrounding. It is in this manner, by the concurrent and co-operating actions of absorption and deposition, that the maxillary ridges attain ultimately the smooth, regular and symmetrical form noticeable when the changes are completed.

In view of the facts just advanced, the inquiry suggests itself, how soon after the extraction of the natural teeth may an artificial appliance be introduced into the mouth consistently with the conditions at first existing, and the integrity of the new formations?

We are amongst those who believe that the best interests of the patient require the early introduction of artificial substitutes, in all cases demanding full dentures. By so doing, we are enabled to confer immediate and signal benefits, by preserving, in a great measure, the customary expression of the individual,—promoting easy and distinct enunciation—assisting in the more perfect comminution of food, and by maintaining unchanged the habitual relation of the jaws. The very general recognition of these important advantages has led to great unanimity of opinion in regard to the propriety and necessity of inserting what are termed *temporary* sets of artificial teeth.

More recently, the policy of inserting artificial teeth *immediately* after the extraction of the natural organs, is being advocated. Although the practice is seemingly heroic and hazardous, the reasons for its adoption are plausible. It is claimed that the inflamed parts, being shielded by a perfectly adapted plate, are less subject to injury in munching food, that when uncovered, the pressure in the former case being distributed over a larger surface, thereby equalizing the forces applied in mastication. Some good is also doubtless accomplished in these cases, by protecting the wounded and inflamed structures from the irritating action of the atmosphere and from sudden and direct impressions of extreme heat and cold.

On the other hand, it is held that the pressure of the base upon, and contact with, abraded surfaces already inflamed and sensitive, can not fail to aggravate existing morbid conditions. If such be the case, the practice may be fairly challenged; for any mode of procedure that would tend to increase the inflammation unavoidably present after the

extraction of the teeth, or that would serve to extend it beyond the period of time when it should spontaneously subside, or that would interrupt, in any considerable degree, the reparative processes going on within the socket, is clearly inadmissable. Observation has fully confirmed us in the belief that active inflammation in the structures about the sockets retards absorption, and delays the completion of those changes which it is important should occur at the earliest period consistent with the natural operations of the economy. We have frequently noticed, as we have no doubt all have who have given the subject attention, that in cases where even moderate inflammation of the parts, either from local or constitutional causes, has continued long after the usual period for its subsidence, little or no absorption has taken place. As well as we can remember, all of those cases of unusual tardiness, where the gums have remained almost wholly unchanged for a period of several weeks together, inflammation of a somewhat intractable character was found present, the gums remaining somewhat turgid, with diffused redness and some tenderness on pressure. Whether the causes operative are systemic or local, the condition manifestly opposes the action of the absorbents, their functions, for the time being, resting apparently in abeyance.

Our experience does not justify us in expressing a positive opinion as to the propriety or impropriety of inserting a plate at the earliest possible period after the removal of the natural organs. If solicited so to do, we should have no hesitation, after having extracted the teeth, in taking the impression during the same sitting, and proceed with the operation at once, although it has been our usual practice to defer it until the more active stages of the inflammation, and the soreness consequent thereon, had, in a great measure, subsided.

In all cases, where the substitute is applied at an early period, the cavities in the model, corresponding with the sockets of the teeth, should be filled up even with the surface of the ridge, that the plate when made may not project into the sockets, and prevent, by mechanical obstruction, the normal development of the granular formations, which are essential to the integrity of all the parts, and which can not be interrupted in any considerable degree without influencing the ultimate form of the jaw. It is in this manner that irregularities on the surface of the ridge are often produced, and not, as is erroneously supposed, by mere *pressure* of the base, the inequalities on the surface of which produce corresponding impressions upon the ridge.

A Good Anæsthetic.—Bromic ether, 1 part; alcohol, 11 parts; chloroform, 3 parts. Recommended to the Tri-State Medical Association at Indianapolis, Ind., 1883.

PHYSICAL FORCE.

BY LEVI C. LANE, M.D.

As in the organic world physicists regard all phases of force as masked forms of motion, so I venture the theory, and predict that some day all sensation will be referred to the same head, and that pain in the future philosophy of life will be resolved into intensified motion, and that the amount of energy expended in the phenomenon of pain will be measured by an arc on the dial-plate of an æsthanomic dynamometer. The problem in medicine in which mankind has been most interested in the solution, has been to find means to clog the motion in the disordered nerve-cords—to check the speed of the wheels of life down the fatal declivity of disease and to restore the posterior sensory columns to the peaceful equilibrium of health. Or where complete restoration cannot be reached, how to reach partial relief.

As the knife of vivisection may be laid separately at the root of the trunk of motion, or of sensation, so certain substances when introduced into the blood act in a similar way. Thus medicine has learned to lay its finger on each of these functions, and, so to speak, temporarily stop either of these wheels of life. In respect to motion medicine learned its first lessons from the aborigines who inhabit the region near the Orinoco in South America; a drop of a matter obtained as some say from the skin of a frog, as others think from a plant, has the wonderful property of depriving of motion an animal inoculated with it; and as the flesh of the animal thus palsied is not rendered poisonous, the Indian infects the points of his arrows with the curara and uses the same to secure his game. The peccary or wild hog wounded with such arrows quickly loses the power of his limbs and so becomes an easy prey to his pursuer. Such weapon became an individual aid to the Indian, both in chase and war.

Medical science, ever on the alert to add to its resources, was not slow to perceive the value of such an agent, and at once employed it to control the excessive contraction of the muscles in lockjaw. Prudently administered this agent has cured a number of cases of this frightful disease; and likewise persons poisoned by strychnia have been relieved by the use of the arrow poison. Large doses of chloral hydrate act in a similar way; this medicine, like some magician's wand, waved over the wild storm on the anterior nervous field of the tetanic subject, often quickly brings quiet, and speedy rescue from a painful death. The discovery of this agent was not due to the aborigines, nor was it the result of an accident or a lucky blunder; but we owe it to the keen intelligence of an experimental physiologist—Liebrich, of Berlin—who compounded and first learned the action of chloral on the lower animals. The medicines here mentioned are capable of

great harm as well as of great good, so that the hand which skilfully uses them must have both daring and caution—daring, to slow the wheels of life, and caution, not to stop them. The timid hand fearing to do too much, halts too early, while the rash one may overreach the aim; for despite the boasted powers of our art, with the great dramatist we must confess that when once the vital spark has been extinguished, we know not where is the power that can this light relume.

DENTAL SPECIMENS FOR THE MICROSCOPE.

BY HENRY S. CHASE, ST. LOUIS.

To students and progressive young practitioners:

Everything is comparatively easy to do after you know how, and have done it a great many times. I am often asked: "How do you make your specimens?" When I answer, the inquirer says: "That seems to be a great deal of work!" Oh yes, it is a great deal of work, but if you love the work, the work loves you, and makes itself as agreeable and light as possible.

So far as the operations of making a specimen are concerned, they are very simple. Let us see: here is a bicuspid tooth, extracted in regulating, and it is not decayed. Now, I will take a watch-spring saw, or a thin file, and cut it up into thin cross-sections. I hold the crown in a small pair of straight forceps, and, commencing at the apex of the root, saw off a piece two mil., or the thirteenth of an inch in length. This is laid down by itself, and another section made and laid by the side of the former, a third one is cut and laid by the side of the latter, thus proceeding until the whole root is cut up as far as the enamel, the relative position of each part preserved in the row of pieces corresponding to its place in the whole root. The object of this is that each part can be accurately described after being made, and thus we can always be able to tell the exact portion of the root from which any particular section came. This is of great importance if you wish to accurately study the histology of the teeth. The enamel being too hard to cut with the saw, we can only cut the crown up with a thin file. Don't be discouraged if you break three or four files in cutting up the crown. We have cut up the crown now, and so have about fourteen sections altogether. These are to be rubbed down as thin as tissue paper. We must have three stones to do this. Purchase at the hardware store a very coarse scythe stone, a sand stone six or eight inches long and an inch thick. Call this No. 1. The next stone may be a scythe stone of finer grit. This is No. 2. A third stone, nearly, but not quite as fine as the "Arkansas stone," which all dentists use, is No. 3. These are all to be used with water. You want a large bow of water on your left, with a small sponge in it. This is to often moist-

en the stone that you are using, and with which to wipe off the debris. We must cut up an old kid glove, not too dirty,—I beg mine of the ladies—pull a glove finger on to the forefinger of your right hand, and press the end of it on the first specimen so that it will imbed itself somewhat in the flesh; place it on No. 1 stone, which is wet, and rub it back and forth until it is one-half thickness; now remove it to stone No. 2, and do the same, but turn it over once or twice on the latter stone, so as to preserve an *even* surface; keep your glove finger as dry as possible, and the "section" will stay in place, but if you get the kid quite wet it will certainly be slipping from place, which will annoy you, and it may even be lost. As the section grows thin the color of the glove begins to show through it. Now put it on No. 3, and polish it down on both sides in the same way, and get it just as thin as can be made without its being worn out. The latter will happen once in a while, and you will think it is lost. The stones should often be wiped off with the clean, moist sponge, for in addition to the debris coming from the section, still more comes from the glove, which latter wears rapidly out, making it necessary for you to put the section on a fresh portion of kid. In my first experiences I often wore the skin off my finger until it bled, without being aware of the fact, the water and the pressure removing its sensibility. When a section is thin enough place it on a clean plate, and put a goblet over it, or a bell glass, or another plate. The same relative position of each piece should be maintained, and so until each specimen is labeled. When all are ready, or before if you wish, the process of "mounting" commences. We must have plenty of plate glass slides, pieces of glass one inch wide and three inches long, also some round or square covers of thin glass, about one one-hundredth of an inch thick. With *thick* glass we can only use "low powers," and so our specimen would be of little value. Both glasses must be perfectly clean. Lay a slide that you are to use across an open paper box, so that its surface shall not be touched. The cover may be laid across the corner of a box so that its surface shall be free. Take a slide in the left hand, and place with a wet penknife blade a section on the slide; now put a few drops of alcohol on the section and slide, and move it about with the knife blade for the purpose of washing off any dust that may be on the section; when this is done, take up the section and place it on the other side of the slide, and immediately cover it with the covering glass, placing the down side of the latter next to the specimen. The object of using the *down* sides of the glasses next to the section is to avoid dust as much as possible. The slide may now be carefully laid across a box or some object from which it can be carefully lifted. We wish the alcohol between the glasses and in the *substance* of the section to dry out. When dry, the *cover* and section will slip off, and the latter be lost, if care is not used in handling.

The slide may now be held over a small spirit lamp to warm the glass and make the balsam, with which it is to be mounted, flow readily. An open mouth, two-ounce bottle of balsam fir is wanted. A worn-out plugger may now be dipped into the balsam so as to have two or three drops adhere to it; place a drop by the edge of the cover, and if the slide is warm it will run under the cover, and through the specimen, more or less expelling the air and making the section look clearer than before. The balsam should occupy the whole area of the cover. It will often be necessary to put a drop at the opposite edge of the cover to accomplish this readily. If you wish to get a *very clear* specimen, the slide may be held above the spirit lamp near enough to gently boil the alcohol which remains in the tissues of the section.

Tiny bubbles in immense numbers will issue from its tubes and cells, and will be replaced by the balsam. The bubbles will all come out from under the cover after a while.

The specimen is now ready for the label. The latter should be as large as the slide. Its middle must be removed so as not to cover the *object*, but may hide every other portion of the glass cover. Now the name of the specimen must be written on the label. To show "how I do it," I will copy one of my labels: "Up. 1st bi. sound. 14 years old, extrd. for Reg. Root, x sec. 1st 1-5 from apex." It is then examined by the mi. under ¼ inch power, and the following additional description written on the label: "Fine cementum; dentine tubes. Cellular."

Now we must have some paper boxes to hold our specimens, a little longer and deeper than the width of the slides. The box will be an inch wide, and will contain ten slides set on their edges. These are placed in the box, and on one end we write "1 x 9." The next box is marked "10 x 19," and contains ten specimens. To be complete a blank book may be procured and used as a catalogue, and so after awhile you will write, in a ruled margin of the page, the "No 500," followed by three or four lines of description, copied from the label and added to by subsequent examination of the specimen under the microscope.

Sections of teeth should be made lengthways as well as across the tooth, both of crowns and roots; and oblique sections also. Only in this way can we get anything like a correct knowledge of the structure. Sections should also be made of every variety of *diseased* teeth.

Those who have no microscope and wish to know more about them, can obtain a catalogue from Jas. M. Queen & Co., New York or Philadelphia, by writing for it. I would recommend their "Students' Microscope, No. 1665." Price, $100.—*Missouri Dental Journal.*

MERCURIAL POISONING—A CASE OF FORTY YEARS' SUFFERING, BUT FINAL CURE.

BY W. F. JOHNSON, EAST CORINTH, MAINE.

Mrs. M., a lady fifty-two years of age, applied to the writer in March, 1881, concerning the condition of her mouth, giving the following history:

At the age of thirteen, when sick with fever, she was treated with calomel. Seventeen years after this treatment the second superior bicuspid and first molar on the right side, together with the alveolar process attached, exfoliated and came away in a body. Soon after the corresponding teeth of the inferior jaw and the two central incisors, together with the alveolar process, exfoliated and came away. After this there was a continuous offensive discharge from the antrum and surrounding parts, until she came under my treatment at the above date, she having received no treatment for the disease of the maxilla up to that time.

She had always been in poor health since her sickness of fever referred to, about forty years before she came under my treatment. Her ill health she attributed solely to the diseased condition of her mouth.

The process of the superior maxilla was eaten away from the canine to the second molar, and extending to nearly the center of the hard palate, making an opening into the antrum and nasal cavities nearly an inch in diameter.

A large portion of the floor of the orbit was destroyed, exposing the eye and causing intense pain in the eye whenever the patient went into cold air, also causing contraction of the inferior rectus muscle, the movements of which could be distinctly seen by the aid of a mirror.

Her remaining teeth being in bad condition I removed them, seventeen in all, after which I commenced treatment of the disease of the maxilla by applying aromatic sulphuric acid, about one-half officinal strength, direct to the part affected, three times a week for two weeks. I then used dilute chloride of zinc twice a week for three weeks in the same manner. In the meantime I directed her to thoroughly cleanse the part three times daily with tepid water, to which about fifteen per cent of phenol sodique had been added. This she did by taking it into her mouth and throwing it out through the nose. The discharge at this time having ceased, I discontinued all treatment except the use of dilute phenol sodique after the above manner, which she continued for about two months. At the end of that time the parts were in a healthy condition. I then inserted a full set of teeth, after the usual manner, on rubber, which she wears constantly. All trouble in the eye ceased, the plate effectually shutting out all cold air.

The treatment in this case was entirely local, no constitutional treatment whatever being employed.

I saw the lady a few days since, and had the pleasure of finding her enjoying excellent health; and, although nearly three years have passed, there has been no return of the discharge, and the parts are, to all appearances, in a healthy condition.

ARTICLE 4.

ANSWERS TO THE QUESTIONS OF THE NATIONAL BOARD OF DENTAL EXAMINERS, FOR THE BENEFIT OF STUDENTS AND OTHERS.

PREPARED FOR "ITEMS OF INTEREST" BY W. S. ELLIOTT, M.D., D.D.S., GOSHEN, N. Y.

"*What is an element?*"

The answer to this may also include answers to such other questions as are propounded in the section of chemistry.

An element is any one of sixty-four specifically distinct kinds of matter found in nature, and of one or more of which every simple and compound body is composed.

Of these sixty-four kinds of matter only a comparatively few are abundant. Those named oxygen, nitrogen, carbon, hydrogen are of this class. These especially enter largely into the structure of the mineral, vegetable, animal, aquatic and aerial world. Oxygen is the most abundant of them all. One-half of the crust of the earth; three-quarters of all animal bodies, one-fifth of the atmosphere and one-third of the ocean is oxygen. Four-fifths of the atmosphere is nitrogen. Carbon comprises one-half of all vegetable substances. It is common to the earth and enters largely into the mineral kingdom. Coal is nearly pure carbon, and quite so is the brilliant worn upon the bosom of the lady elite.

Some of the elements are exceedingly rare and lend but little interest, other than to the professional chemist.

The elements generally exist in a state of combination, or, in quite intimate association. It is important to realize here a distinction. The atmosphere, for instance, is composed of oxygen and nitrogen, but these are only in intimate association. Water is composed of oxygen and hydrogen. In this instance a peculiar combination is entered into which would require a great force to disrupt. *Association* is one physical; *combination* is chemical. The first is molecular; the last is atomic.

The physical characteristics of the elements, when uncombined, are markedly varied. For instance: Oxygen, hydrogen, chlorine, and others, exist in a state of gas; mercury, at ordinary temperature, and bromine are liquids; carbon, the metals and others are solids.

The elements may be likened to the letters of the alphabet, which,

when combined in various ways, according to the rules of syntax, make words. The elements, under given conditions, also join themselves together to make substances, having decided properties, in accordance with the chemical law of affinity.

No knowledge can be gained of the physical properties of a substance, which is the resultant of the combination of the elements, by a study of the nature of each constituent. Thus, it would hardly be inferred that a liquid would be the result of the combination of two gases; yet, such is the case, as, for instance, when oxygen and hydrogen unite.

When a body is made up of only one kind of an element, it is said to be a simple body; and when elements of a different kind enter in, it is known as a compound body.

Gold, silver, mercury, diamond, etc., are simples. Water, earth, wood, alcohol, etc., are compound bodies.

All bodies are sensibly divisible. This division can be carried to a great extent, even so far that the parts can not be seen by the naked eye or the microscope. When the sensual eye cannot perceive how small these parts may be, the mind can picture them so reduced that any further division would expose the individual elements of which they are composed. These last smallest parts of a body are called molecules. A molecule may exist alone, and although separated from its associates, it always retains the characteristics of the mass of which it formed a part. Thus, a molecule of salt is decidedly saline; a molecule of nux is decidedly bitter. But we may break up the molecule; to do this it usually requires considerable force, for the energy which binds the parts of a molecule together is the energy of chemical combination; whereas the force required to separate the molecules from each other is only that which will overcome the cohesive attraction, or the energy of association. It is just here where the distinction is made between the study of physics and of chemistry. The molecule is the unit of the physicist, whereas the parts of a molecule, which are called atoms, are the units of the chemist. When a molecule is divided into its atomic parts, it is always in the presence of other molecules which are similarly broken, and the atoms of each thus freed will immediately recombine in various ways, to form molecules of a different kind. These atoms never will remain isolated; they have inherent attractive energies which are constantly exercised until combination establishes a mutual state of satisfaction and quietude.

There is great disparity in the number of atoms that enter into and constitute the molecules of different substances. Common salt includes only two—one of chlorine and one of sodium. A molecule of water requires three atoms—two of hydrogen and one of oxygen. Quinine is composed of fifty-seven atoms. It is said that a molecule of

hæmoglobin, a constituent of the blood, embraces more than 1800 atoms; and these are parts of only five or six elements.

The elements are divided into two classes—metals and non-metals. Of the former there are fifty; of the latter fourteen. The metals are heavy, capable of being polished, and are the best conductors of electricity and heat. The non-metals are light, and among them is the gas hydrogen, the lightest substance known. This being so H is taken as the unit of atomic weight. All the other elements are weighed in comparison to this. The weight of an atom of hydrogen, as established by Prof. Cook, is a *microcrith*—an arbitrary standard, but adopted as such as is any other standard of measurement—the foot, pound or gallon.

The exact atomic weights of many of the elements has not as yet been made known. The weight of the most common ones, however, is accurately ascertained, and here, as in other of the observed properties, there is large differences. While H weighs one microcrith, oxygen weighs 16, silver 108, bismuth 210, etc.

It must not be understood that these figures express the relative weights of the substances as we usually know them, but only when they are placed under circumstances which force them into a state of gas, because it is only then that the molecules are free to disperse themselves as they will; and it seems a curious fact that whatever element is experimented with, a given volume of its gas will contain, in each instance, exactly the same number of molecules. Hence the law of Avogadro: *Equal volumes of all substances, when in the state of gas, and under like conditions, contain the same number of molecules.*

When these substances are condensed from their gaseous state, the ratio of condensation varies, consequently the specific gravity of the solid or liquid cannot agree with the comparative weight of the relative atoms. For example: The atomic weight of bismuth is 210; that of platinum is 198; yet platinum has a specific gravity more than double that of bismuth.

The Phosphates.—The American people are casting away or feeding to animals, that small portion of the wheat berry which alone contains the elements of nutrition for the bones, teeth and muscles. The commercial bran of wheat placed under a microscope shows the gluten cells still adhering to it; and besides this, another portion, namely, the shorts, which is rich in phosphates, is also removed from the *superfine flour*. This latter is the material of which our wives, mothers and sisters delight to make bread, cake, etc., beautiful to the sight, delightful to taste, but in which lurks the insidious foes of the dental organs—Imperfect Development, Defective Nutrition, and Disintegration.—*Dr. H. S. Chase.*

LETTERS FROM A MOTHER TO A MOTHER ON THE FORMATION, GROWTH AND CARE OF THE TEETH.

BY MRS. M. W. J.

LETTER IV.—FOOD PRINCIPLES.

To furnish the system with the necessary lime-salts, you must not for a moment imagine that I would advise you to attempt the use of *lime* itself, in the crude form in which it is known to you, though much benefit is derived from the free use of *lime water*, prepared from this crude lime; very cheaply and easily prepared at home, though quite expensive when obtained from the druggist.

To make it yourself, you require simply a teacupful of clean lime, such as is used by house-builders.

Put this in a quart pitcher and fill it with cold water, stirring thoroughly until it looks like milk; tie a piece of thin muslin over the pitcher and let it stand twenty-four hours, or until perfectly clear; pour it off carefully, straining through the muslin, being careful not to disturb the lime, and stop as soon as it is the least cloudy. Keep this clear lime water in a bottle for constant use, refilling the pitcher on the same lime, and stirring well. This can be repeated several times, or until the lime loses its strength, when the pitcher must be emptied and washed, and the process renewed.

A tablespoonful of this lime water, in a glass of water or milk, is imperceptible to the taste, and even two or three are not unpleasant. It leaves a peculiar sweet and pleasant taste in the mouth, though if too strong it is harsh and acrid.

This alone, taken three times a day, has been found beneficial to prospective mothers, in hardening teeth rendered soft and sensitive from deficient mineral lime salts; also in hardening children's teeth, and in hastening their development when late in coming into place.

It should also be used to rinse the mouth and *bathe the teeth* after the use of acid fruits, or lemonade, or strong medicines. Of the effect of acids upon the teeth, more will be said in another chapter.

We will now investigate the subject of "Food Principles," and endeavor to learn where the essential elements are to be found, in such shape as to be readily digested and assimilated by the human system, passing from the stomach to be taken up by the little blood vessels and conveyed to every portion of the body, "teeth and toe-nails" included.

We must know "what to eat, when to eat and how to eat."

The human body is composed of thirteen essential chemical elements, variously combined. These same elements are necessarily the elements of the food from which the body is built up.

The most simple classification of nutritive principles places them all

under four heads: the *aqueous*, the *saccharine*, the *oleaginous*, and the *albuminous*.

By the combination of these principles, our foods are formed. Milk, the one article of food furnished by nature for the young human being, contains the types of all four groups—the aqueous as water, the saccharine as sugar, the oleaginous as butter, and the albuminous as casein or curd.

Milk is therefore a perfect article of food, containing all the essential principles of infantile nutrition.

In the brute creation, through obedience to nature's laws, the milk is what it should be, and the offspring, as a rule, healthy, with sound and perfect teeth.

That the human mother's milk may be what it should be, and her offspring also be healthy and have sound teeth, her milk must contain the chemical elements which are essential to these four nutritive principles. Her milk is evolved from her blood; her blood is evolved from her food; therefore her food must contain these elements.

Dr. A. C. Castle said twenty years ago, that "chemical analysis demonstrates the natural milk almost identical with the blood, abounding with the phosphates. Indeed, with correctness, it might be asserted that the difference between milk and blood is in color—the one is white, and the other red."

It is not necessary that I should place before you a list of *all* the articles of diet from which we may obtain the elements of nutrition.

No one article of diet can supply one single element of nutrition, for so generously has nature supplied them, and so variously has she combined them, that we can hardly go astray if we use her gifts aright.

But alas! in the refinements of our *higher civilization* we deprive ourselves of her most precious gifts, rejecting scornfully the very elements most essential to our physical well-being.

The beasts of the field accept her gifts with rejoicing, and thrive thereon. The poor savage, in his native wilds, has coarse fare and few comforts, but he is erect and strong, and his teeth are sound and regular.

A well-known writer and dentist says: "I am often asked, when discoursing upon this subject to my patients, 'What articles of food ought we to eat in order to make good teeth?' I answer, everything that grows will make good teeth, if eaten in their natural state, no elements being taken out, for every one of them does make good teeth for horses, cows, sheep, and all other animals that live on nature's productions, pure and unadulterated."

That you and your children may be strong and your teeth sound, I do not ask you to eat grass, nor do I ask you to go back to a state of savagery, but I do ask you to take your food in the proportions in which nature provides it.

And this brings us back again to your question: "Where shall I find these elements?" In my next letter I will endeavor to help you to answer this question.

LETTER V.—WHERE THE ELEMENTS OF TOOTH SUBSTANCE ARE FOUND—CALCIUM.

The constituents of tooth substance being what we are chiefly looking for, we will first take the chemical element, *calcium*, or *lime*, which we have seen to be the principal element in tooth substance.

Calcium is generously furnished by nature. It is found in milk, in eggs, in potatoes, and many other vegetables and fruits; but especially does it abound in the grains or cereals, which furnish a large proportion of our food; and most abundantly is it found in wheat, which furnishes "the staff of life;" but, alas! *not* in the fine white flour of which are made the snowy loaves of bread which the good housewife displays with such pride.

Dr. N. J. Bellows, of Boston, speaking of food, says: "It is well known that our pale-faced girls, and our feeble-minded children, are brought into that condition mainly by living on sugar, butter, and superfine flour, out of which have been taken the very elements that make bone and blood, and give energy to the brain and nervous system; and the common sense remedy for all these terrible evils is to be found in a simple resort to nature's own storehouse."

In 500 pounds of *whole grain* (wheat) there is:

Muscle material	78 pounds.
Bone and teeth materials	85 "
Fat principle	12 "

500 pounds of *fine flour* contain:

Muscle material	65 pounds.
Bone and teeth materials	30 "
Fat principle	10 "

Thus in flour, *as generally used*, to quote the words of Dr. John Allen, of New York city, a dentist of fifty years' experience, who has given this subject much attention:

"We change the proportions of the mineral element (which is deposited in the outer portion of the grain) by bolting out nearly two-thirds of it from every barrel of flour, and discarding it from the staff of life, simply because it is the fashion to have our bread made of the finest flour, that it may be light instead of dark.

"It is estimated that a healthy child consumes half a barrel of flour in a year, and if this be fine white flour the child is denied twenty pounds a year of that portion of the grain which contains the proper materials for bones and teeth. This deficiency of the mineral element

in the food causes the teeth to be comparatively soft and chalky in their structure, and the result is, in this country, where fine flour is principally used for bread, there is not one in twenty without more or less decayed teeth before they have passed the morning of life."

Flour from the whole grain of wheat, as prepared to-day, is very different from the old-fashioned "Graham flour," though still retaining the name.

It contains all the mineral elements, but the outer portions of the grain (in which these elements are found, and which is separated and rejected by the "bolting" or sifting process which gives the fine white flour in general use) are so finely ground, and so thoroughly incorporated with the whiter portions or heart of the berry, (and which consist only of gluten and starch) as to change only the *color* of the flour, while making it sweet and pleasant to the taste, and without any of the unpleasant coarseness of the olden methods which incorporated the *bran* in coarse flakes, repugnant to all delicate palates, and indigestible to many stomachs.

The color of the bread made from the "Graham flour" of to-day is no more objectionable than that imparted to the finest white flour by the sugar, eggs, spices and other ingredients used in making cakes, which are never rejected because of their color, whatever may be said of their digestibility, or, rather, their *indigestibility*.

Use "Graham flour," then, for your bread, your biscuits, and such plain cakes and gingerbread as alone are admissible for children, or for yourself either, if you would have perfect health.

Above all, "Graham *gems*" for breakfast, instead of hot white biscuit. battercakes, etc. These can only be properly baked in the cast-iron gem-pans, which come in sets of from eight to twelve shallow cups, joined together in one pan. This should be placed in the oven to heat, previous to mixing the batter.

For the batter use only fresh "Graham flour" and cold water, with a little salt; no lard or butter, but plenty of "elbow grease," and no yeast powder or soda. Mix the batter rather thin, and stir rapidly and thoroughly till it is in a foam; then drop it quickly into the hot pans, and place immediately in a quick oven, and you will have a light, sweet, toothsome puff, which can be eaten with impunity by the direst dyspeptic.

If your grocer cannot supply you with such flour as I have described, order "The Best Amber Graham Flour" from the "Cascade Mills" of "F. Schumacher," Akron, Ohio.

It is preferable not to have a large quantity at once, as in warm weather it readily generates small white worms and little black weavils. Get your neighbor to join you in ordering a barrel, and then you will benefit them as well as yourself.

If fine white flour must be used, the nutritive elements, lost in the bran, can be in a degree restored by the use of Prof. Horsford's "Self-raising Bread Preparation" in place of the ordinary yeast and "baking powders" or the old-fashioned "Soda and Cream Tartar."

The former is put up in two small packages; one of chemically pure bi-carbonate of soda, the other a combination of phosphoric acid with lime and magnesia—the essential constituents of tooth substance. Each package of one dozen contains the proper measure, and instructions for use. It loses its value and "leavening" properties with age, and should therefore be purchased only from reliable first class grocers. The two packages are combined in "Horsford's Phosphatic Baking-powder," but this deteriorates very rapidly, and should only be used when known to be fresh from the manufacturers, at the Rumford Chemical Works, Rhode Island.

Oatmeal is also an invaluable article of diet, as a source of bone and tooth food.

"Hecker's partly cooked oatmeal" is to be found in every first class grocery.

A double boiler is almost indispensable for properly cooking, not only oatmeal, but also grits or hominy, which are also good tooth food, though not equal to whole wheat or oatmeal.

A porcelain receptacle, suspended in the tin boiler containing the boiling water, renders *burning* impossible even to the most careless cook, prevents all waste, and does away with the necessity of stirring; once placed over the fire, it can cook undisturbed until wanted; indeed, the longer the better.

Now, if your diet consists largely of milk and eggs, potatoes and good meat, with abundance of ripe fruits, supplemented by "Graham" bread in its different forms, and a good bowl of oatmeal and milk for your breakfast every day, you will not fare *very hard*, while your system will be well supplied with lime-salts for both yourself and your babe.

If the "Graham" bread should prove really unpalatable at first, you can begin by mixing with your white flour one-third or even one-fourth the quantity of "Graham," and thus accustom yourself to it gradually. Even so small a proportion will carry with it some benefit, and you will soon learn to like it as well, if not to prefer it, to all white flour. Mere *taste*, however, is a matter of small consideration, compared with the great interests at stake.

There are some highly favored portions of our country where these precautions are rendered unnecessary by kind nature. In Middle Tennessee, West Virginia, and the "blue-grass region" of Kentucky, the soil, and consequently the vegetation and well water, is so strongly impregnated with lime-salts as to give a large supply of this element to

all articles of food, both animal and vegetable, and consequently a corresponding superiority of tooth and bone structure to both the people and the live-stock.

It is well known that the finest horses and cattle in the world graze upon the rich pastures of the limestone soil of Kentucky, and that her tall, strong men, with their fine teeth, are recognized wherever they go. —*Southern Dental Journal.*

DENTITION AS INDICATIVE OF THE AGE OF THE ANIMALS OF THE FARM.

BY PROF. G. T. BROWN.

[From the "Dental Record," Eng.]

Early maturity is the *sine qua non* of breeders and exhibitors of farm stock, and it is one of the objects of agricultural societies to encourage them in their efforts to produce breeds which reach a state of perfect development at a comparatively youthful period. In order that judges of stock may be in a position to decide between animals of undoubted merit, the age is in all cases to be taken into account; and it is presumed that of the competing animals, which are in other respects equal, the youngest will receive the palm. Whether or not the practice is invariably in conformity with this theory may be open to question, but there is no doubt that the principle is correct, and in order that it may be carried into effect it is necessary to inform the judges of the exact age of each animal in every class.

THE TEETH OF THE HORSE.

Among the animals of the farm, the horse has always occupied a prominent position, and everything relating to its management in health and disease has received special attention. It is not, therefore, remarkable that horsemen were familiar with the method of judging the animal's age by the teeth long before it was ascertained that a similar method was applicable to other farm stock. And at the present time, although the investigations which have been carried out by veterinary authorities on the Continent and in this country have led to the collection of a large amount of valuable evidence in reference to the development of the teeth of the ox, sheep, and pig, the fact must be admitted that the teeth of the horse exhibit reliable indications of the age for a much longer period than those of any other animal.

The ages of cattle, sheep and swine are to be judged with accuracy only during the period occupied by the cutting of the temporary teeth and their replacement by permanent organs; but a peculiar conformation of the teeth of the horse enables the expert to form an opinion of

the animal's age long after the completion of permanent dentition. Girard carries his description of the changes which occur in the form of the tables of the incisor teeth, or more properly the nippers, up to the age of twenty years, but very few observers of the present day would venture to assert whether a horse were sixteen or twenty years old; and for practical purposes it is not necessary to pursue the inquiry beyond the age of twelve or fourteen years.

When dentition is completed the horse has six incisors or nippers in the front of the mouth in both lower and upper jaws, and twenty-four molars, six on each side, in the jaw.

In the male there are also four tusks, one on each side of the upper and lower jaws, between the corner incisors and the molar teeth. Small conical teeth, known as wolves' teeth, appear in many instances in front of the first upper molars in the colt, and sometimes remain after the temporary are exchanged for permanent teeth; but as merely rudimentary organs they will not require any notice beyond the statement that a vulgar prejudice has assigned to them a special significance as a cause of blindness, and on this ground they are often punched out. If this operation is roughly done it is a mere act of cruelty. In any case it is superfluous. But, so far as the teeth are concerned, their retention or removal is a matter of indifference.

It is customary in regard to the horse, as to other animals of the farm, to judge the age by the incisor teeth, for the probable reason that they are more easily examined. The amateur may be content to form an opinion from the mere cursory inspection of the signs which are most readily observed; but the professional examiner is expected to take advantage of all the evidence which he can obtain by a critical inspection of molars and incisors, and he is further required to realize the undoubted fact that in some animals at certain periods of dentition the molar teeth afford more certain indications of age than the incisors.

The temporary tooth is much smaller than the permanent organ, and also the distinction between the upper part of the tooth or crown and the fang is much more marked in the milk-tooth; in fact, the permanent incisor does not indicate any actual line of separation between the upper and lower portions.

While the temporary dentition is proceeding, and also during the time that the permanent are taking the places of the temporary teeth, the examiner may form an opinion of the age by merely noting what teeth are in the mouth; but when these changes are completed he is compelled to base his conclusion upon the evidence which he gains from an inspection of the tables of the incisor teeth, those of the lower jaws being always selected. In doing this he has to observe whether the cavity or mark extends across the tooth, or is surrounded by a line of worn structure, in which case the table is said to be fully formed.

TRUTH AND THE PROFESSORS.

BY C. S. BOYNTON, M.D., BRANDON, VT.

[Part of paper read before the American Dental Convention, at Saratoga, N. Y.]

We often refer with pride to the fact that we live in an age of progress, and point with admiration to the rapid strides which science has made in the last half century.

But if we pause and consider how long many discoveries, of priceless value to humanity, have been hidden under the bushel of professional prejudice, or lies openly revealed before any steps are taken toward their practical application, humiliation takes the place of pride; and we find the same spirit that disputed the truths of Galileo and Hunter still alive.

For more than two thousand years the attraction of light bodies by amber was the sum of human knowledge regarding electricity, and for more than two thousand years fermentation was effected without any knowledge of its cause.

"Our remote ancestors had learned by experience that 'Wine maketh glad the heart of man.' Noah, we are informed, planted a vineyard, drank of the wine and experienced the consequences."

It is a matter of history that one discovery grows out of or follows another, and cannot appear without its proper antecedent.

Thus the microscope had to be invented and brought to a considerable degree of perfection before the phenomena of fermentation could be understood.

In the year 1680, Leeuwenhock found yeast to be a mass of floating globules, and for a period of one hundred and fifty years this was all that was known regarding it.

In 1837, Schwann clearly established the connection between putrefaction and organic life; but thirty years had to elapse before Lister extended to wounds the results of the researches of Schwann on dead flesh and animal infusions.

Prior to Lister, the possibility of some such extension had occurred to other minds.

Observing men had noticed the action of germs which produced uptrefaction of meat, and had asked themselves the question—Might not these same germs act with fatal effect in the wards of a hospital?

The physicians of this period, guided entirely by empirical knowledge, were in this respect "wiser than they knew."

They had discovered the evils incident to dirt, and, by keeping dirt away from them, had saved many lives; but why dirt was fatal, few of them knew. Lister came forward with this scientific truth: Dirt was fatal, not as dirt, but because it contained living germs which Schwann

was the first to prove are the cause of putrefaction, thus by one step changing the art of surgery into a science.

In 1864, in a paper read before the British Medical Association, Mr. Spencer Wells pointed out that the then recent experiments of Pasteur had "all a very important bearing upon the development of purulent infection and the whole class of diseases most fatal in hospitals and over-crowded places."

Two years prior to this, Dr. William Budd had drawn up a series of "Suggestions towards a Scheme for the Investigation of Epidemic and Epizootic Diseases." "What we most want to know," says Budd, "in regard to this whole group of diseases is, *where and how the specific poisons which cause them breed and multiply.*"

The word poisons here employed was a concession on Budd's part to his weaker brethren; for he, without a shade of doubt, considered the poison to be a real living seed.

From this time on, the investigation has progressed, carried on in the old Baconian lines of observation and experiment—spurred on by the investigations of Burdon, Sanderson, Koch and others.

It has grown and multiplied till the germ theory has forced itself upon the notice of every scientist, whether he would accept the doctrine or not. It has solved many a problem which hitherto has been looked upon as past finding out, or blindly accepted as a punishment sent by the Almighty for the sins of the people.

But the progress of these investigations has been greatly hindered by the popular fallacy in the minds of many of confounding scientific knowledge with practical uselessness.

The scientific thinker is met on all sides by the oft-repeated question, "Will it pay?" or, "What is the use?"

It is natural for man to wish to investigate whatever gives evidence of thought. The field of thought is the home of a thinking being—the home of man; and whatever manifests thought, without evil associations, is never to be regarded as useless. He may not have so far analyzed his intellectual forces as to know why he is impelled to this or that investigation. He is unable to give a satisfactory answer to those who demand the use. But he knows there is a use, as he knows that food strengthens the body, although he may be in happy ignorance of such an organ as the stomach, and have no notion of the peculiar office of carbon and nitrogen compounds. He cannot tell how food acts, but he goes on eating, for his appetite demands it; and, in satisfying its cravings, the good of the body is cared for.

So this intellectual appetite has led men to dig among ruins, to wipe the dust from the ancient inscription, to gather as a pearl every monument of human thought, to scan every form of matter as it exists in nature—the crystal and the flower—the animal, from the largest to the

animalcule—those now living, and those sleeping in their beds of stone. This intellectual appetite has led men to labor, though unable to frame arguments in favor of what they knew to be right, and it has always led them in the right direction. With us, physical activity is considered by many the chief end of man. In the general apprehension, the study-lamp of the student shines on an idle dreamer—a drone in the great hive.

Says one of the profoundest philosophers that England ever produced: "It would not be difficult, by an unbroken chain of historic facts, to demonstrate that the most important discoveries in science and improvements in the mechanic arts had their origin, not in the cabinets of statesmen or in the practical insight of men of business, but in the visions of recluse genius."

WONDERFULLY MADE.

REMARKS OF DR. JOHN W. DRAPER, AT CHICKERING HALL.

As grand as is the great temple of God's creation in the heavens, there is something still grander,—the invisible temple of the human mind. Is there not something profoundly impressive in this, that the human mind can look from without upon itself, as one looks at his phantom image in a mirror, and discern its own lineaments and admire its own movements? My own thoughts have of late years been forcibly drawn to this, from a recognition that the interpretation by the mind of impressions from without takes place under mathematical laws; as, for instance, that when external ethereal vibrations create in the mind a certain idea, that same idea will arise when the vibrations are doubled, or tripled, or quadrupled in frequency, and other ideas will be engendered by vibrations of an intermediate rate. Yet what these ideas will be may be predicted. It is true that this is only an optical case, but it extends the view that has been offered to us by a study of the structure of the ear. In the labyrinthine compartment of that organ, the ultimate fibers of the auditory nerve are laid on the winding plane of the spiral lamina, in ever decreasing lengths, each capable of trembling to the sound which is in unison with it—a mechanical action truly, answering to the sympathetic vibration with which the strings of a piano will respond to the corresponding notes of a flute—and these are translated by the mind into all the utterances of articulate speech, all the harmonies of music—speech that engenders new ideas within us; strains which, though they may die away in the air, live forever in the memory. The exquisite delight we experience in listening to the works of our great composers arises thus in mechanical movements, which are the issue of mathematical combinations. The unseen world is under the influence of number!

But what is number except there be one who numbers? When Pompey, in his Syrian war, broke into the holy of holies at Jerusalem, he expressed, as Tacitus tells us, his astonishment that there was no image of a Divinity within—the shrine was silent and empty. And so, though after death we may anatomize and explore the inmost recesses of the brain, the vailed Genius that once presided there has eluded us, and has not left so much as a phantom trace, a shadow of himself.

The experiments of Galvani and Volta have not yet reached their conclusion; those of Faraday and Du Bois Raymond have only yielded a preliminary suggestion as to the nervous force. Excepting the great sympathetic nerve, the nervous fibers themselves are, as is well known, of two classes—those that gather the impressions of external things and convey them to the nerve centers, and those that transmit the dictates of the will from within outwardly. The capabilities of one of the former—the apparatus for sight—have been greatly improved by various optical contrivances, such as microscopes and telescopes, an earnest of what may hereafter be done as respects the four other special organs of sense; and as concerns the second class, the result of mental operations, the resolves of the will, may be transmitted with greater velocity than even in the living system itself, and that across vast terrestrial distances, or even beneath the sea. Telegraphic wires are, strictly speaking, continuations of the centrifugal nerves, and we are not without reason for believing that it is the same influence which is active in both cases.

In a scientific point of view, such improvements in the capabilities of the organs for receiving external impressions, such extensions in the distances to which the results of intellectual acts and the dictates of the will may be conveyed, constitute a true development, an evolution, none the less real though it may be of an artificial kind. If we reflect carefully on these things, bearing in mind what is now known of the course of development in the animal series, we shall not fail to remark what a singular interest gathers around these artificial developments—artificial they can scarcely be called, since they themselves have arisen interiorly. They are the result of intellectual acts. Man has been developing himself. He, so far as the earth is concerned, is becoming omnipresent. The electrical nerves of society are spread in a plexus all over Europe and America; their commissural strands run under the Atlantic and the Pacific.

Thoroughness does not necessitate roughness. Delicate manipulation may be quite as complete, and is generally more perfect. It is precision that makes completeness.

Says Tomes: *By the addition of gold and platinum* to silver and tin alloys, we obtain one agent which controls to a great degree the shrinkage, and another which causes the amalgam to harden quickly. Mr. Fletcher, who, as far as I am aware, was the first to suggest the use of an alloy of this kind for amalgams, says that the amalgam called "platinum amalgam" is composed of the ordinary silver and tin alloy, with ten per cent fine gold, to which sufficient platinum is added to cause it to set quickly. When used with a small amount of mercury, it becomes so hard that often at the same sitting of the patient it can be finished with files and burnishers. It moreover keeps its color well.

A true amalgam should contain no free mercury, but, as usually prepared, there is a very great excess. If only a small proportion be used, the amalgam hardens very much sooner.

An amalgam hardens quicker when the fillings or cuttings of the alloy are moderately coarse than when they are fine. When they are freshly made, or have been kept from the air, they also harden sooner, and moreover discolor less.

Amalgam fillings should always be carefully polished and burnished, if we wish to obtain the best results. Many fillings will retain a bright surface for years if polished, which otherwise would be quite dark.

Excision of Alveolus after Extraction of Teeth.—I have made a common practice of removing, with a cutting forceps, large portions of the transverse processes, or speta, and the outer and inner plates of the alveolus, especially where the lip is naturally short, the gums and alveolus unnaturally prominent, and the prospect is presented that several months' absorption will make the case what otherwise it could not have been,—one suitable for gum teeth. After the extraction of the incisors, cuspids, and bicuspids, cut cleanly across the gum down to the process, as far as you propose to excise; then slip your knife under, and dissect away in one piece. The excision can then be proceeded with, taking care to remove all you cut. I have been surprised to see difficult cases, treated in this way, return in eight or ten weeks with the mouth quite as ready for an impression as it generally is in four months when the alveolus is left to the natural process of absorption. Nothing is done in this operation to *increase* the inflammation which usually ensues after the extraction of teeth. Astringent washes ought always to be used.—*Dr. Geo. Beers, Montreal.*

Contour signifies the line that bounds, defines, or terminates a figure. Whether a cavity be large or small, the gold should be built out a little beyond the line or margin of the cavity, so that it may be trimmed off in conformity with the contour line of the tooth. This being true, it

is then certain that all fillings should be contour, at least, so far as that part of the gold which is built against the margin of enamel is concerned. If the gold be not impacted against, and made full with the edges of enamel, the operation will not be such as is demanded for the preservation of the remaining tooth structure. Even when so impacted, and the fillings are finished, so that a *plane* surface of gold remains, the tooth thus operated upon will most likely come in contact with the one adjoining, and this plane surface allow the enamel of the one to approximate closely the enamel of the other to cause further decay. This should be obviated by restoring the contour of the tooth —by having the line of the gold to conform to the original contour of the lost tissue—and then, when a tooth so operated upon approximates the next in the arch, the most prominent part of the portion restored in gold will come in contact, and thus leave the margin of enamel free.—*M. H. Webb.*

The unhealthfulness of our calling, says Dr. Shepard, is not so great as is sometimes represented. I know of a large number of old men in practice; several between sixty and seventy. Their work may or may not be as good as when younger. At seventy the vision is not as perfect, the fingers as obedient to the mind, or the back as supple as in earlier days. We do not see so great a proportion of old men at our meetings now, owing to the growth in numbers. If all the men in practice thirty-six years ago were living to-day, they would present but a small proportion to the whole number in practice at present. The great mass of dentists are in good health and compare favorably in this respect with other callings. With the usual exceptions those who are not in good health are those who have violated the laws of health. They have over-worked, and neglected out-door exercise and the proper food. Good health can be secured by the dentist in appreciating the business and the enjoyment of each day's duties. He who looks upon his work as drudgery, cannot accomplish the best results with the least drain upon his vital force. I thoroughly enjoy my work, hence am always well. The higher the motive, the more one feels that he is doing good, the more free is he from thoughts of pecuniary consideration, the less fatigue will he experience, and the better will be the quality of his operations.

In the review of the invertebrate animals we see that in the lowest there is no alimentary canal or mouth. Then by a pouching of the external surface we have formed an alimentary sac with but one aperture, and this sac external to the body. When we advance up the scale of animated beings we find that this sac is elongated and recurved,

having an inlet and an outlet, thus forming a complete intestine. In crustaceans we see that the exoskeleton, or hard outer shell, is modified into maxilla and maxillapeds, and that these, also in common with other parts of the surface, are covered with tuberosities, giving a dentate or toothed appearance to the jaws. Higher in the scale we find the mouth armed with an odontofore or toothed strap. Then we come to that great sub-kingdom vertebrata, where the hardened frame work of the body is internal and covered with layers of muscles, skin, etc. And as we ascend in the scale of organization, we find an increasing differentiation of tissue, first upon the surface, and gradually toward the interior, in a similar manner as we observe the formation of a denser envelope or cell wall upon the periphery of an elementary cell. In a similar manner also, and by the same causes, is produced that differentiation of tissue which we recognize as bone, cementum, dentine and its varieties.—*Thomas Gaddes.*

Vitality is that mysterious something that distinguishes organic from inorganic bodies. We call it vitality, vital force, vital element, vital principle, the principle of animation, the living principle, life. We call it an energizing force, a power. Whether we define it by one or by many words, neither one nor all are adequate to bring out from the pale of mystery that which we attempt to define, and place it in a clear light of intellectual perception. It is mysterious, still, and incomprehensible as mind. Its incomprehensibility forestalls our efforts to gain a conception of its true nature, and renders unphilosophical any attempt at complete definition. Yet we have no difficulty with ourselves in this regard when we talk on the subject, for the conscious possession of life as a vitalizing force within us, compels the most ready intellectual assent to the fact, inexplicable as it is. When a man says by the force of inward consciousness, *I live,* he cares not who says, "You know not what you are talking about," and he scorns any attempt at an analytic solution of the fact. An appeal to consciousness is a sufficient verification of it.—*Dr. L. C. Ingersoll.*

The American Dental Association is receiving some severe cuts through the press. We hope the matter will not go so far as to create a division and the formation of a new society. We have now quite enough. There is one organization, however, which we think should be strengthened from all quarters, namely, the National. How would it do to make this Association emphatically *the* Association of the United States, with its permanent lodging in Washington, and there to create a national dental museum, which would add much in interest

and instruction? We make the motion. Who will second it?—*Southern Dental Journal.*

[This suggestion is especially timely now that the American Dental Convention is dissolved. If the strength that has been in these two organizations could be centered in the National and this centered in Washington as a permanent *Institute*, we think it would be a grand thing.—ED.]

PHOSPHATE OF ZINC "STUCK ON."

DR. C. R. TAYLOR, STREATOR, ILL.

Two years ago a lady came to have a cavity on the lower sixth-year molar filled; the cause of the cavity was chemical erosion. The cavity extended from the center of the grinding surface to the buccal surface of the tooth, so that the buccal cusp had been abraded one-fourth of the distance to the gum; the enamel standing all around a little higher than the dentine, forming a saucer-shaped cavity on an inclined plane. The dentine being exquisitely sensitive, it was decided to experiment. The dam being on, the surface was dry, some of Welch's Phosphate of Zinc was mixed thin and placed in the cavity, and filled nearly full, then as it began to harden some soft amalgam was rubbed in with a burnisher, and then some harder amalgam added. The object in filling thus was the hope that when the filling failed the dentine would bear excavating and a gold filling put in. Results: Lady seen a few days ago. Filling in good condition, and being used every day, the same as though it was not *stuck* on.

GREASING IMPRESSIONS.

Dr. Adams, try again. Having obtained valuable hints from you some years ago, I do not wish you to lose what I consider the best way of separating casts from impressions. The shellac is used thin, and only as a line of demarkation—it will separate without any varnish. Varnish as soon as the impression is removed from the mouth, when the varnish is absorbed immerse in water, raise the impression once or twice, and as soon as you can not see bubbles run the plaster. When hard it will part easier and be the most perfect cast you ever drew. I have used oil, soap, sandarac and water, and in no way has my success equalled the latter.

W. H. HERTZ, Hazleton, Pa.

The Tennessee Dental Association meets at Nashville on the third Tuesday of February. President, J. H. Prewitt, Madisonville, Ky. Secretary, J. H. Crawford, Nashville.

TWO PECULIAR CASES.

Ed. Items:—Two peculiar cases have recently come to my notice that I wish to bring before the whole profession, that I may get additional knowledge from them, viz.: A healthy and perfectly formed female child, now 20 months old, three months ago erupted her four central incisors. They came very slow and were regularly scalloped on the edges, but at this time are almost perfect, and seem to be formed of good material. The strange part is that she is now erupting the four first molars, with no signs of her four laterals. All the teeth that have thus far appeared came nearly together as fours—if any precedence the upper coming first. The child has always had the best of care. The mother is healthy, and did not wean the babe until two months ago. The father may have had syphilis some years ago, but there is no certain knowledge that it was or was not true syphilis. Can any one inform me if similar cases have been seen, why this is so, and give advice as to treatment, if any is deemed necessary?

The other case is that of a young lady who was thrown from a vehicle. Besides other injuries, her front teeth were loosened and corners broken off. The left lateral (upper) was sore a long time, but became well in time. After a year she came to me to have the corner of tooth contoured with gold, remarking that I must work carefully, as the tooth did not feel quite sound. Imagine my surprise at finding the tooth entirely broken in two parts at the edge of the alveolus, or a trifle above. The break seems to be clean and square, and the crown portion is movable backwards and forwards. The nerve is alive the whole length, and all the surrounding parts in health. Will it be safe to build out the corner? Did any one ever know of such a case? Would be glad to receive information through the Items, or by letter.

H. E. VanHorne,

Syracuse, N. Y.

Troy, N. Y., Dec. 26th, 1883.

Ed. Items:—In the Items of Interest for January, 1884, I notice the article, "A Singular Case," by A. N. Roussel, of Brooklyn, and he asks if any one has noticed such a case. I can report one exactly similar. A lady wished me to examine her teeth, and especially find the cause of so much pain in the left side of the face. On examination I found the left superior first bicuspid root from apex down half the length of root *entirely* bare. The crown end of root was also protruding from socket nearly a quarter of an inch. The apex of root had caused a sore on the lip. I extracted the root and the pain ceased.

G. B. Young.

Editorial.

THE THERAPEUTIC VALUE OF REST AND SLEEP.

Animals recognize it, why not men? When those below us are in ailment they crawl away where nothing can disturb them and rest. One would suppose they had taken an anæsthetic, so sound asleep do they become. It seems natural that we should do the same, for when the child becomes hurt it instinctively says, "Mamma, put me to sleep;" or, in spite of itself and adverse circumstances, it falls asleep, and sleeps as though it would never wake again. Severe grief is assuaged in this way, and the perplexed brain is calmed by it. Many a disease is cured by it more speedily and thoroughly than by the power of drugs, and many even on the brink of insanity are saved by the comatose effect of an over-taxed brain.

Many a man who seeks to keep up on stimulants had better give way to perfect rest, and dose away the hours or days which he is now spending in exhausting labor. It is a good thing sometimes for a man to be sick—comfortably sick—if only in this way he is forced to retire from the unceasing whirl of business, and think and rest and grow fat again.

Try it sometime. When so "utterly done for" that you think your whole body is going to rack and ruin, instead of sending for the doctor, go to bed, dismiss business and trouble, and turn your face to the wall. Give up everything for rest, and see if rest does not finally bring health and vigor. Now and then you may play with business, and at times take a breezy run to the woods for a hunt or look about for something out of the old rut to invigorate mind and body. But mainly give yourself to rest and abstinence from alcohol, tobacco, pastry and everything you know to be injurious to mind or body.

Often when sick we are in too much of a hurry to get well. Disease is not an identity to be frightened out of the system by a bullet in the shape of a doctor's pill. It is generally a derangement that has been long disorganizing the blood, and though it may show itself in nervous prostration or in some abnormal condition of this or that organ, it is a general toning up that must put all things to rights, from the primitive cell to the most complicated organ, and this means a slow process of repair of many winding, tortuous steps—the creation of new blood corpuscles, the storing of nervous energy, and the charging of every tissue with whatever may be grooped under that magic word, vitality.

Thousands of our lean, anemic, cadaverous women, with "everything" ailing them, need absolute rest more than pills—rest of mind

and body, nerves and spirits. We are not now speaking of the flabby-fleshed, lazy, good-for-nothing imbecile who thinks all the world was made to wait on her. There are really over-taxed women who, from work and worry, wifehood and motherhood, are so exhausted that nothing is enjoyed and every exertion is a burden. If for a few weeks these could be forced to be babies—obliged to give up every responsibility and care—just as they would really have to do if they were bodily prostrate—and made to go to bed and enjoy sweet, sacred, recuperating rest, be fed on the simplest diet, kept from every care, and attended with a strong hand to kneed the muscles and give friction to the skin, they would soon exchange their ademic condition for one of fat and strength. Of course, betimes, they would have to be rolled into the sun for a sun bath, and after sun bathing be subjected to the life-giving oxygen of the purest breezes, and the spirits enlivened with cheery companionship. But all these, including the increasing consumption of beef and other solid food, would not be as expensive as a doctor's bill and not as disagreeable. If really bed and utter rest is not called for, buy her a prescription in the shape of a railroad ticket and send her off where she will not hear the scolding of husband, or crying of children, or know the drudgery of household care—off where she can be as free as a bird on the wing, with rest from everything but the gratification of her own sweet will. "Would not know her on her return?" No; you would probably have to be put to the expense of a new marriage ceremony, but it would pay.

SOME ITEMS OF INTEREST IN PHYSIOLOGY.

NUMBER V.

THE BLOOD.

The blood certainly *looks* like a mass of red fluid. But it is not. So far as it is a fluid at all, it is transparent. It requires such delicate instruments to solve the mystery of its real character that a great part of its investigation is comparatively recent. We now say the blood is made up of minute jelly-like disks or corpuscles, floating in a limpid fluid of serum. But this is an imperfect definition. Look at one of these little wheels separately. Where is its redness? It is certainly not there. If it has any color we must call it yellow. And yet in mass they are red. Look through a beautiful piece of French plate glass. How transparent it is, how devoid of all color. But double it, and continue adding piece to piece. Soon you will say the glass is blue, and after adding many pieces you will say it is very blue, and, finally, it is so full of color you cannot see through it at all. These little disks or corpuscles of blood separately are so thin as scarcely to obstruct the light, but in their aggregate of three thousand to the inch they not only show their true red color, but are opaque.

There are other little specks in the fluid we call blood that are not red even by seeing them in multitude. They are called white corpuscles. Their shape, too, is different from the red; and, instead of being like them, little disks strung on a string, or pressing against each other as they crowd their way along, here single file, there as a compact army, but always in close contact and generally in great regularity, these white corpuscles are more like little balls, irregular in their numbers, positions and motions, and ever changing in their appearance. They are slightly larger than the red, and yet, from their shape and peculiar character, they are found often where the red disks could never come.

Well, is this all there is of the blood? Is it possible that brain and muscle, blood vessels and bone, and all the various organs, are made up from this jelly and this transparent fluid? That from this comes life, and growth, and strength? This solid frame work? This substantial, enduring, thinking, willing, aggressive "body of diverse parts?" Yes, and no. All is made up of this insinuating, persistent, ever-present fluid, for it contains all the elements from which all is made. But what we see is not all there is. There is more of the unseen than the seen—more of the spiritual than the material—a something we call life which metamorphizes the inorganic into the organic, the crude into the refined, the elementary into the compound, the materials which we pronounce dead into active potency, living entities, not only a power in themselves, but the source of all power and increase in every part of the system.

We spoke of the serum of the blood as a limpid, transparent fluid. Would you call the white of an egg such a fluid? And yet both are similar substances; the former containing much more water. Catch some blood as it flows from a slain animal, and let it coagulate. Outside the clot will be seen this watery fluid called serum. Boil it down till it becomes thick by the evaporation of the water,—ah, it will not boil at all; instead of boilling down, as soon as it becomes hot it thickens as does the white of the egg—both are albumen.

And that clot—what relation has this to those specks we said really constituted the true blood? Whip it up with a bush and see how filled your bush will be with a stringy, tough substance. Is this the corpuscles of the blood? Wash away all the fluid portion and look at it. See, it is not red, as the blood is. It is not jelly-like, as are the corpuscles of the blood. It is not in disintegrated particles, like the specks in the blood. In fact, it has no resemblance to them either in appearance or physical composition. We call it fibrine. Did it become stringy and tough by the whipping? No; for you can gather the same minute fibers from the clot by simply washing. Now, does all this look as though this fibrine and the corpuscles we have spoken of are identical? Look narrowly and you will find that after you

have gathered most of the fibrine from the clot there will be still left a quantity of these corpuscles entangled in a network of fibrine. And if the clot in the pail and the corpuscles in the living blood are the same, why does not the blood clot in its living, normal circulation? It is not because that in flowing from the veins it becomes cool, for often it becomes very cold in our extremities in wintry weather, and, also, if it is shed in a very cold atmosphere, it will not clot at all—it must be warm, and the warmer the quicker it clots. Nor is it because it becomes motionless. Its life is gone. That seems to be all the explanation we can give of its clotting, which really is not an explanation, but simply a statement of fact. And the difference between this fibrous clot and the corpuscles of the living blood we can not give.

Apparently, there is great similarity in the composition of the blood corpuscles. In fact, as we have stated, they look like mere specks of jelly. Even under the microscope, there is little evidence of structure or the most simple organization. Yet, if we look closely and continuously, there does seem to be some change going on within them. As soon as they come to assume any definite shape they burst asunder, and form new spheres, which in turn again divide; and thus, like living beings, they go on propagating their kind from the time the contents of the lacteals are emptied into the venous blood on to its return to the lungs, to their grand triumphant entry into their homes in the organized structure they are designed to build up.

Yes, as simple, as jelly-like, and as much alike as these little specks seem to be, within them are all the elements which go to make up all there is of the various structures of the body. And so different is their composition that each has its special mission to build up specific structures. Not organized are they? They are so delicately organized and intelligent that by very instinct each knows from its birth its destiny and rushes on to do its life work. And they make no mistake in going where they are not needed. As by age or work a corpuscle dies and is dragged off through the veins, on comes one full of new life to take its place, ever and anon keeping up the grand balance of supply and waste. And they made no mistake in going to the wrong tissue. Though a brain and a bone corpuscle travel side by side, just at the right place the brain carrier reports for duty to the brain and the bone carrier to the skull, and each knows the precise spot where they will be needed. None of these little intelligences who are hurrying toward a hungry and over-taxed tissue to feed it can be induced to go aside and enter a sleepy, adipose cell.

But what is this round of connection between the blood that goes and the blood that comes?—The blood which rushes with its precious freight to build up, and that which is coming all burdened with the debris of decaying nature? We *call* it the capillary system, which in-

dicates the terminals of the arteries and the beginnings of the veins. But *really*, what is it? How is it? Even, where is it? We cannot see these unseeable passages, nor know their workings. We are only acquainted with the results. Yet we know that only here and only thus is the system built up and its worn-out particles taken up.

TEACH THE PEOPLE.

It is not enough that we repair waste and give substitutes for the lost. This is only the work of the mechanician. The prevention of disease, the instruction of the people in what is right, showing them how to avoid dis-ease, this is the prominent work of the professional. It is this which must raise us above the sphere of mere mechanics to the dignity of a profession. What we want is that broad, liberal culture which fits us to be the teachers of the people, and then that philanthropy which is characteristic of the highest quality of wisdom. Do you say this will not bring the dollars? Yes, it will, and with the dollars that which is more important—the consciousness of faithful doing. The trouble with many of us is that the first and foremost thing we concern ourselves about is the reward—not those qualifications and conditions that make the reward inevitable. Many of us would, if we could, seize the prize at the goal without earning it in the race. We put the consequences before the conditions. When this is the case, of course we are not qualified to instruct others in right doing. Christ taught this lesson when he said, "Seek ye first the kingdom of heaven and its righteousness, and all these things shall be added to you." Then we shall appreciate that other injunction, "Freely ye have received, freely give."

To have gold show unnecessarily conspicuously is an evidence of poor taste, or dishonorable work. There are patients who are not satisfied to have an approximal filling upon the front teeth hidden; they will pay more to have it "show well." This should be discouraged, and it will be by every conscientious and intelligent dentist. But there are those in the profession who, instead of discouraging it, make this false, vulgar taste a source of revenue. Sound enamel is destroyed, and a great oval patch of gold is made to show when the cavity was insignificant, or, at any rate, could have remained hidden. This is worse than the perverted taste of a patient. Perhaps it would be charitable to charge it to poor judgment. We fear it is too often from sinister motives. It is done purposely "to show off to the best advantage." In other words, it makes it look like a bigger job, and he gets more money. It is a pity such dishonorable practitioners have any standing in the profession. The only way to make them gravitate to their proper level is to create a proper public taste, and make a general demand for more honorable dealing.

The deffinition of disease, if we are to judge by the notions of many, must be a thing, an identity, an enemy who has insinuated himself into our system to torture and to destroy us; and that he locates himself sometimes in this organ and sometimes in that, according to his freaks and fancies. Therapeutics then is that application of materia medica by which he may be dislodged; so that we have one medicine so constituted as, when taken into the mouth, rushes to this organ, and another to that, and so on through the array of medicines and organs, where a war for supremacy or extermination is fought.

We have not so learned our lesson. We conceive that disease is merely a departure from healthy action or condition; and that our main duty in cure is to assist nature in re-establishing its normal action and condition, or in failure to do this, as in a carious tooth, to so substitute an artificial for a natural part as not to interfere with the normal action of its surroundings.

The idea, therefore, that we can have disease of one organ without a degree of abnormality throughout the whole system leads us astray, and it will be equally inconsistent to seek the cure of one diseased part without recognizing that this is an exhibition of some general defect in the system.

Thirteen at Table.—The statistical probability of the superstition that if thirteen sit down to table one of them will die in the course of the following twelve months, is given in a French paper, from which it appears that the chances are that if the average age of the company is 10 years, there ought to be 134 persons present for one to die inside of one year; 15, 131; 20, 129; 25, 124; 30, 119; 35, 112; 40, 103; 45, 90; 50, 73; 55, 54; 60, 35; 65, 25; 70, 17; and if the average age is 72½ years and 13 persons present the realization of the theory is scientifically likely.

Liquid Glue.—100 parts of ordinary gelatine are dissolved in 400 parts of water containing 6 to 7 parts of oxalic acid. The solution is kept for five or six hours on the water-bath, in a porcelain infusion pot, after which it is neutralized with carbonate of calcium, the insoluble precipitate filtered off, and the clear filtrate evaporated at a moderate temperature, until about 200 parts are obtained. The product is a durable, slightly-tinted, but clear liquid glue.

The number of years which must be spent in study before obtaining a degree in medicine in various countries are as follows: Sweden, ten; Holland, Italy, and Switzerland, six; Norway, eight; Denmark, six and seven; Belgium, six; Russia, Portugal, Austria, and Hungary, five; France, England, and Canada, four; United States, three and two; and Spain, two.

Miscellaneous.

ITEMS IN CHEMISTRY.

BY H. E. ROSCOE.

ALUMINIUM.

This metal is obtained from clay, and is contained in large quantities in many rocks. No one would suppose that a bright, silver-white metal could be got out of common clay, and yet chemists can do so. It is a pity that it is not easy to get rid of the oxygen in the clay, for then we might use the bright metal aluminium for very many purposes. It costs too much to make the metal, although clay is so cheap and common. When this is heated in the air, it burns and forms an oxide called alumina, the earth of clay.

CALCIUM

is a metal difficult to get in the pure state, although its compounds are very common. Quicklime is calcium oxide; chalk and marble and limestone and coral are all calcium carbonate; gypsum is calcium sulphate; and bone earth is calcium phosphate. So you see that there is plenty of this metal in the earth.

In making carbonic acid from chalk and hydrochloric acid, the liquid remaining in the bottle is a solution of calcium chloride. If you filter the liquid and boil down the clear solution to dryness, you will find a white, dry powder left. This is a salt called calcium chloride. Let a little of the dry powder remain exposed to the air for a few hours; you will then find that it has become liquid, because it has absorbed, or taken up, the moisture which is always present in the air.

If you add some of the clear solution labelled "sodium carbonate," to a little of the dry powder of calcium chloride, which you have dissolved in some water in a test-tube, you will see that the two clear liquids at once become milky or turbid. This is because calcium carbonate, or chalk, is produced, and the chalk is insoluble, or does not dissolve in water, as the calcium chloride does, and is therefore thrown down, or precipitated.

MAGNESIUM

is a soft, silver-white metal, which can be made into wire and ribbon.

If you hold the end of a bit of magnesium ribbon about six or eight inches long in the flame, the metal will take fire, and burn with a daz-

zling white light, and a white powder will fall on the ground. This white powder is magnesia, the oxide of the metal. Black as well as white fumes will be seen while the magnesium is burning. The black fume is not soot, for there is no carbon present; it consists of some of the metal, which is not burnt, but is sent off as a cloud having a black color; the white fume is the solid oxide magnesia going off in fine dust.

If you collect some of this white powder and warm it in a test-tube, with a few drops of sulphuric acid, the white powder will dissolve; then pour the clear solution into a porcelain basin, and boil off the greater part of the water. On cooling, some long needle-shaped crystals will be found in the basin. These crystals are magnesium sulphate or epsom salts; a compound of magnesia and sulphuric acid.

There are many other compounds of magnesium, some of which are found in minerals and rocks. The metal is never found uncombined, and the process for making it from magnesia is rather a costly one; still it is now used for burning, and for making fireworks and signals, where a very bright light is needed. It keeps bright in dry air, and might be used for many purposes if it could be produced cheaply.

SODIUM

is very unlike any metal which we see used in the arts; we cannot keep sodium in the air, because it at once oxidizes and forms a white powder. We must not allow water to come near it, as it will combine at once with the oxygen of the water, and set free the hydrogen; it must be kept under rock oil, which contains no oxygen. A bit of this curious metal, thrown on to water, swims on the surface, and hydrogen is given off.

Sodium does not occur in the free state in nature; it is made by taking away the oxygen from soda. If you heat sodium over the flame of a lamp, it will first melt, and then take fire and burn with a bright yellow-colored flame; white fumes of the oxide (soda) will be given off.

POTASSIUM

is the metal contained in the alkali potash, and in the potash salts. A piece as large as half a pea, thrown on to water, combines so violently with the oxygen, that the hydrogen at once catches fire and burns, the same being colored violet by the alkali potash which is formed.

Potash salts are found in many places in the earth, and also in the ashes of plants; and this alkali derives its name because it can be got by boiling out wood ashes in pots. There are many useful potash salts; soda and potash are called the alkalies.

Soap is made by boiling animal or vegetable oils or fats with alkali. Soaps containing soda are hard soaps; potash gives soft soaps. You can easily make soap by pouring half an ounce of castor oil into a thin

porcelain basin with some hot water, and adding some caustic soda; then on boiling the liquor the oil will all disappear, and soap will be formed which dissolves in the water. When it has boiled for a little, throw in a little salt; this will dissolve in the water, and drive out the soap, which will swim on the surface. When cool this soap will become a white, hard solid, and may be used for washing. Common oils or fats are generally used; we have taken castor oil, because it is made into soap more easily than ordinary fats.

ZINC

is a useful white metal. It is used for covering iron plate, which is then said to be galvanized iron. This covering of zinc prevents the iron from rusting in damp air. The chief ore of the metal is zinc sulphide, a compound of zinc and sulphur called blende. Zinc is also used to mix with other metals to form useful alloys; thus brass is an alloy of zinc and copper, and it is, therefore, not a simple or elementary body.

If we dissolve zinc in dilute sulphuric acid, we get hydrogen gas given off and zinc sulphate left. Filter some of the liquid obtained in making hydrogen, and then evaporate it down. On allowing it to cool, white crystals of zinc sulphate will be formed.

To get rid of Ants.—The *Scientific News* says: We can give the results of three ant invasions in a single household; two being of the small red species, and the third of the larger black one. A strong solution of carbolic acid was prepared, and with this the shelves of the closet were thoroughly washed, the liquid being allowed to soak somewhat into cracks and crevices. Only one application was required, not a single ant being seen afterward. This was the most remarkable, as one of the closets was in a central part of the house, and it might have been expected that the insects driven from thence would appear somewhere else on the premises. It is probable that the whole colony was destroyed by the acid. As already stated, a *strong* solution was used, —nearly saturated—and we have no doubt that the thorough extermination of the little pests was due to this fact.

In cases of pericemental inflammation I have for several years secured good results by splitting a raisin and applying the cut surface to the gum. It recently occurred to me that by sprinkling the cut surface of the raisin with capsicum, a very simple substitute for the pepper bag might be obtained. The result proves highly satisfactory; the counter-irritation being produced and the cheeks protected as thoroughly as with the pepper bag. G. S. PALMER, Waterville, Me.

HOW TO GET ALONG.

Pay as you go.
Never fool in business matters.
Do not kick every one in your path.
Learn to think and act for yourself.
Keep ahead rather than behind the times.
Don't stop to tell stories in business hours.
Have order, system, regularity and promptness.
Use your own brains rather than those of others.
Do not meddle with business you know nothing of.
A man of honor respects his word as he does his bond.
No man can get rich by sitting around stores and saloons.
If you have a place of business, be found there when wanted.

MISTAKES.

It is a mistake to labor when you know you are not in a fit condition to do so.

To think the more a person eats the healthier and stronger he will become.

To go to bed at midnight and arise at day-break and imagine that every hour taken from sleep is an hour gained.

To imagine that if a little work or exercise is good, violent or prolonged exercise is better.

To conclude that the smallest room in the house is large enough to sleep in.

To eat as if you only had a minute to finish the meal in, or to eat without an appetite, or to continue after it has been satisfied, merely to satisfy the taste.

To believe that children can do as much work as grown people, and that the more hours they study the more they learn.

To imagine that whatever remedy causes one to feel immediately better (as alcoholic stimulants) is good for the system, without regard to the after effects.

CARBOLIZED IODOFORM.

The following formula is given by C. Sherk (Berlicer Klin-Wochenschrift) as a great improvement over iodoform:

R.—Iodoform,	10 gr.
Acid, carbolic,	5 gr.
Ol. menth. pip.,	2 drops.

The acid is to be rubbed up with iodoform, and the peppermint oil added subsequently. The disagreeable odor of the drug is completely covered, and it is not again developed even at an elevated temperature.